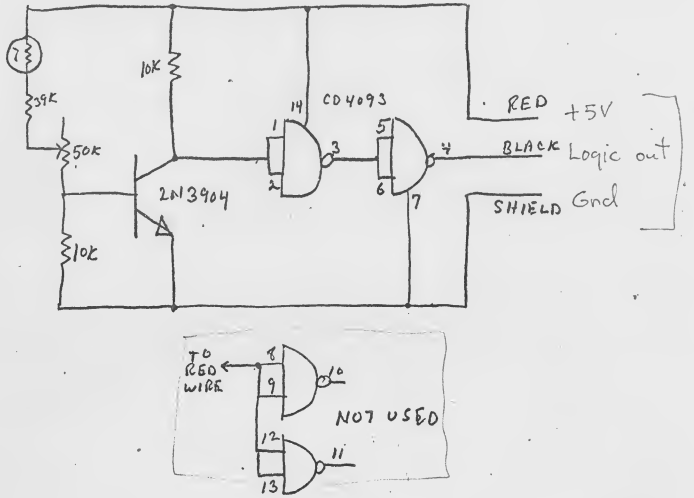
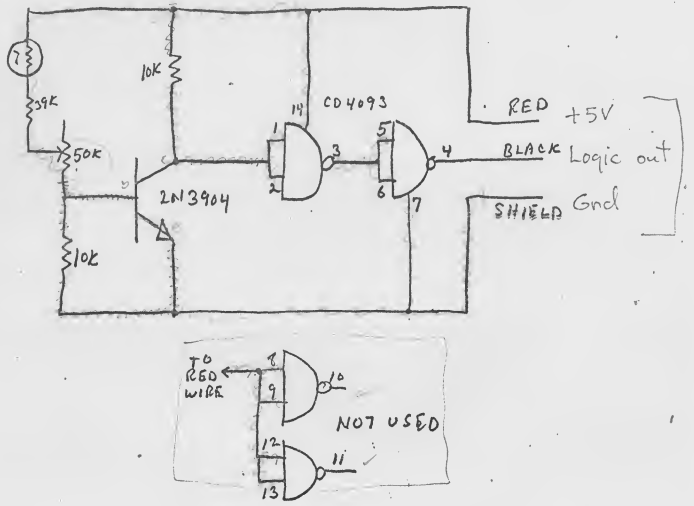


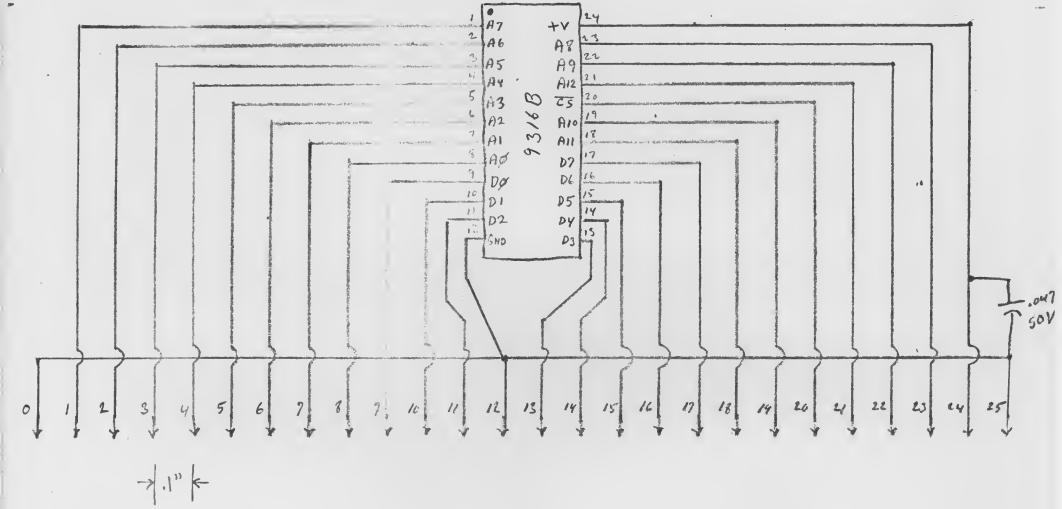
For Light Pen to work use &(14)=X &(15)=Y- As per hackers. Make a Loop which will produce a flashing box in center screen 0,0 Make &(14)=0 &(15)=0 Run & use pen to turn box on & off Can also be used to start next page of reading Mat. on Screen. by putting flashing Cursor at end of that page or List.

by Bill Hanssen


10K
39K
50K
10K
2N3904
CD4093
14
1
2
3
5
6
4
7
RED +5V
BLACK Logic out
SHIELD Gnd
to Light pen Input.
TO RED WIRE
8
9
10
12
11
13
NOT USED

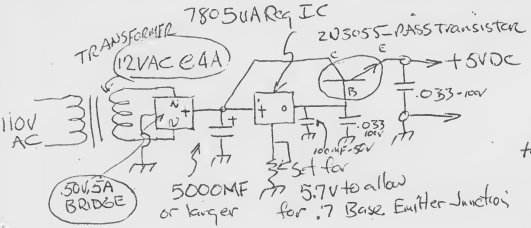
M671M

CASSETTE

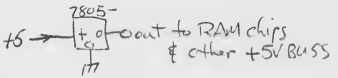


TMS4732 NL by RE. HINES

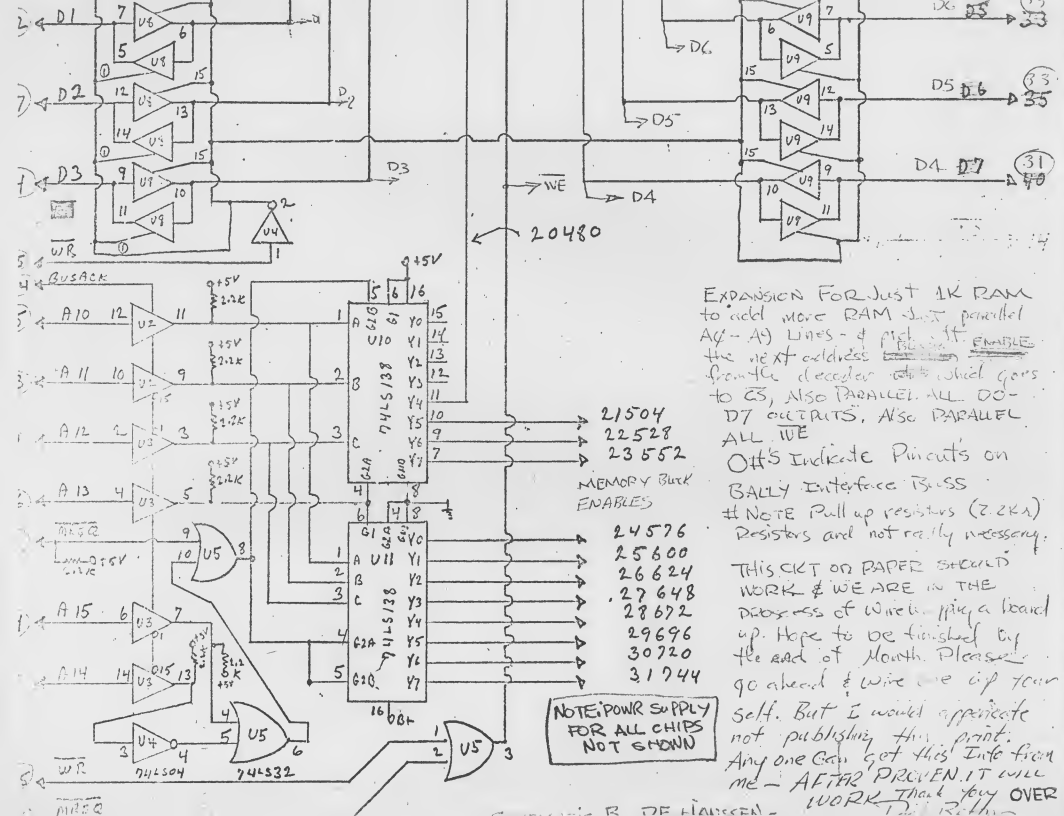
The only thing that should be Tied in to Bally is System ground. All no-Acy outputs All D0-D7 outputs $\overline{RD}$, $\overline{WR}$, $\overline{MREQ}$, Logic Signals. And ~~BUSACK~~ You Must Build a seperate +5VDC Supply, I recomend +5V ±.1V@4A Supply.



I recommend 7805 regulator chips for ever additional 1K RAM



.. this is

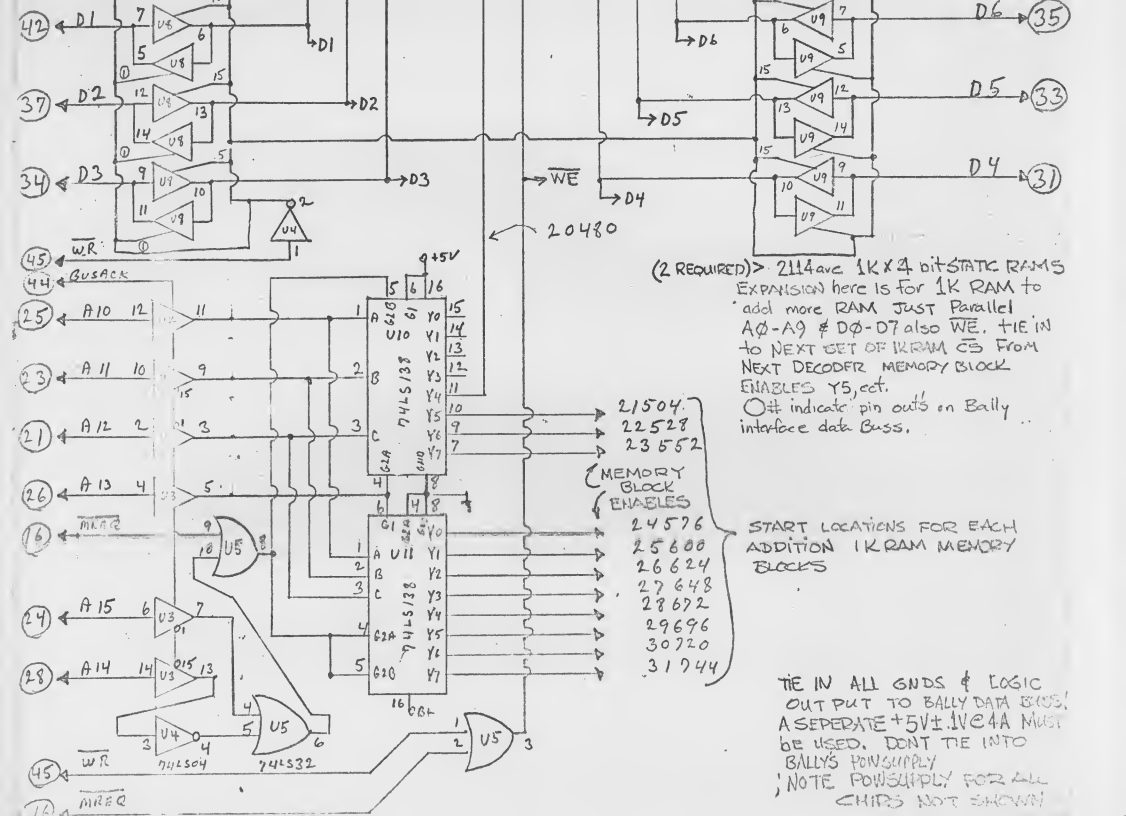


EXPANSION FOR JUST 1K RAM to add more RAM just parallel A9 - A1 Lines - & pick off the next address from the decoder which goes to CS, Also PARALLEL ALL DO-D7 OUTPUTS, Also PARALLEL ALL WE

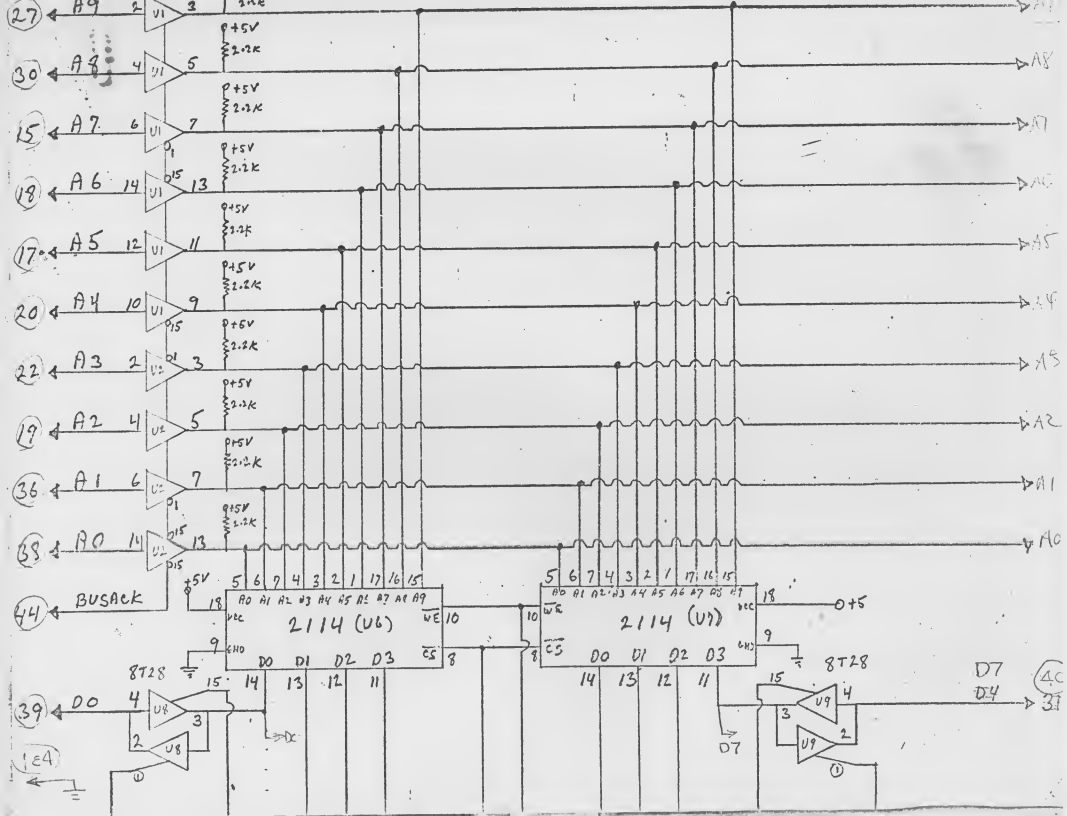
O#'S Indicate Pinouts on BALLY Interface Buss

NOTE Pull up resistors (2.2KΩ) Resistors are not really necessary.

THIS CKT on PAPER SHOULD WORK & WE ARE IN THE process of wire wrapping a board up. Hope to be finished by the end of Month. Please go ahead & wire one up your self. But I would appreciate not publishing this print. Any one can get this Info from me — AFTER PROVEN IT will WORK Thank you OVER


(42) D1
D1
(37) D2
D2
(34) D3
D3
(45) WR
(44) BUSACK
(25) A10
(23) A11
(21) A12
(26) A13
(16) MREQ
(24) A15
(28) A14
WE
D4
D5
D6
20480
(35) D6
(33) D5
(31) D4
+5V
U10 74LS138
U11 74LS138
74LS04
74LS32
21504
22528
23552
MEMORY BLOCK ENABLES
24576
25600
26624
27648
28672
29696
30720
31744
START LOCATIONS FOR EACH ADDITION 1K RAM MEMORY BLOCKS
(2 REQUIRED)> 2114 avc 1K X 4 bit STATIC RAMS
EXPANSION here is for 1K RAM to add more RAM JUST Parallel AØ-A9 & DØ-D7 also WE. tie in to NEXT SET OF 1K RAM CS From NEXT DECODER MEMORY BLOCK ENABLES Y5, ect.
Ø# indicate pin outs on Bally interface data Buss.
TIE IN ALL GNDS & LOGIC OUT PUT TO BALLY DATA BUSS! A SEPERATE +5V±.1V@4A MUST be USED. DONT TIE INTO BALLYS POWSUPPLY
NOTE POWSUPPLY FOR ALL CHIPS NOT SHOWN

27 A9 2 U1 3
30 A8 4 U1 5
15 A7 6 U1 7
18 A6 14 U1 13
17 A5 12 U1 11
20 A4 10 U1 9
22 A3 2 U1 3
19 A2 4 U1 5
36 A1 6 U1 7
38 A0 14 U2 13
44 BUSACK
+5V
2114 (U6)
2114 (U7)
8T28
39 D0 4 U8 3
2 U8
D0
D7
40
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
+5
GND
VCC


A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
+5V
2.2K
BUSACK
2114 (U6)
2114 (U7)
8T28
D0
D1
D2
D3
D7
D4